4.8 NOISE

The primary focus of Section 4.8 is construction noise and mitigation measures to lessen and avoid the potential noise impacts on sensitive human receptors. Potential noise impacts on marine and near-coastal biological resources are addressed in Section 4.5.

4.8.1 Environmental Setting

Existing Conditions

Community Noise

A measurement scale that simulates human perception is customarily used to describe environmental noise and to assess project impacts on surrounding areas that are sensitive to community noise. The A-weighted scale of frequency sensitivity accounts for the sensitivity of the human ear, which is less sensitive to low frequencies (below 1,000 cycles per second, or 1 kHz), and correlates well with human perceptions of the annoying aspects of noise. The A-weighted decibel scale (dBA) is cited in most noise criteria. Decibels are logarithmic units that can be used to conveniently compare wide ranges of sound intensities.

Human activities cause community noise levels to be widely variable over time. For simplicity, sound levels are usually best represented by an equivalent level over a given time period (Leq) or by an average level occurring over a 24-hour day-night period (Ldn). The Leq, or equivalent sound level, is a single value (in dBA) for any desired duration, which includes all of the time-varying sound energy in the measurement period, usually one hour. The Ldn, or day-night average sound level, is equal to the 24-hour A-weighted equivalent sound level with a 10-decibel penalty applied to nighttime sounds occurring between 10:00 p.m. and 7:00 a.m.

Community noise levels depend on the intensity of nearby human activity. Noise levels are generally considered low when ambient levels are below 45 dBA, moderate in the 45 to 60 dBA range, and high above 60 dBA. In wilderness areas, the Ldn noise levels can be below 35 dBA. Levels around 75 dBA are more common in busy urban areas, and levels up to 85 dBA occur near major freeways and airports. Although people often accept the higher levels associated with very noisy urban residential and residential-commercial zones, they nevertheless are considered to be adverse to public health.

The surrounding land uses dictate what noise levels would be considered acceptable or unacceptable. Because of diurnal activity, nighttime ambient levels in urban

environments are about seven decibels lower than the corresponding daytime levels. In rural areas away from roads and other human activity, the day-to-night difference can be considerably less. Areas with residences are often considered incompatible with substantial nighttime noise because of the likelihood of disrupting sleep. Noise levels above 45 dBA at night can result in the onset of sleep interference. At 70 dBA, sleep interference effects become considerable (U.S. EPA 1974).

Noise Environment in the Project Area

Noise levels in Moss Landing vary depending on the proximity to human activity, transportation facilities, the Moss Landing Power Plant, and the activity of the surf. Ambient noise levels are lowest when away from human activity, including boat and on-road traffic. The Monterey County General Plan shows that noise levels from Highway 1 are above 60 Ldn for points in the Moss Landing Harbor, facing the highway. The Moss Landing Power Plant causes less than 40 Ldn at the Moss Landing State Beach and between 40 and 45 Ldn at the Salinas River State Beach, south of MBARI (Monterey County 2004).

Noise Sensitive Areas

Noise sensitive receptors and noise-sensitive areas are residences, schools, religious facilities, and parks. The Moss Landing State Beach is located immediately north of MBARI property on the north side of the channel to Moss Landing Harbor, and the Salinas River State Beach is south of MBARI main campus, adjacent to the Moss Landing Marine Laboratories pier. There are no homes or residences near the potential shore landing locations of the proposed Project or alternative landings.

Underwater Acoustics

The behavior of noise is determined by the medium through which the sound travels. Sounds traveling in air and water are both measured using a logarithmic decibel scale, but because of the different properties of air and water, marine sounds are normally referenced to a more sensitive baseline. As a result, underwater sound intensity levels cannot be directly compared to on-land noise levels.

Because recreational divers may be present in the MBNMS, it may be desirable to put underwater sound levels into terms that humans can appreciate. To adjust for the acoustic differences between air and water, subtracting 62 dB from an underwater sound level that is referenced to one micro-Pascal converts the sound intensity to its equivalent level in air (WDCS 2003). All underwater and marine noise levels in this analysis are expressed in terms of decibels (dB), referenced to one micro-Pascal.

Underwater Noise Levels

Marine noise in the MBNMS is affected by natural sources (wind, wave, and surf), vessel traffic, and research. At moderate wind speeds over deep open water, the natural noise levels are generally about 60 dB, with levels ranging over 100 dB closer to the surface when vessel traffic is nearby. Most shipping and work traffic causes noise below 1 kHz, while sound from smaller leisure craft is generally between 1 kHz and 50 kHz (WDCS 2003). Research or seismic exploration using acoustic tests is normally short term and can cause transmissions of varying frequency up to a maximum source levels over 200 dB. Some typical noise sources are summarized in Table 4.8-1.

Table 4.8-1. Summary of Typical Marine Noise Sources

Source	Frequency (kHz)	Underwater Source Level (dB, reference 1 µPa)
Jet-ski	0.8 to 50	75 to 125
Rigid inflatable (1.5 ft; 5 meter Zodiac)	6.3	152
Fishing trawler	0.1	158
Work boat (10.4 ft; 34 meter, twin diesel engine)	0.63	159
Freighter (41.1 ft; 135 meter)	0.04	172
Container ship (83.5 ft; 274 meter)	0.01	181
Offshore platform drill	0.4	185
Offshore dredging	0.1 to 0.16	185
Acoustic thermometry (ATOC) test source	0.025	195
Search and surveillance (SONAR) source	2 to 57	Over 230

Source: WDCS, 2003.

4.8.2 Regulatory Setting

Federal

There are no federal noise standards that directly regulate environmental noise and no restrictions on underwater noise within the MBNMS (15 CFR §922). With regard to noise exposure and workers, the federal Occupational Safety and Health Administration (OSHA) establishes regulations to safeguard the hearing of workers exposed to occupational noise (29 CFR §1910.95). OSHA specifies that sustained noise over 85 dBA can be a threat to workers' hearing.

State

The State of California requires each local government to perform noise surveys and implement a noise element as part of their general plan. Generally speaking, noise levels less than 60 Ldn are acceptable for all land uses, including residences, schools,

and other noise sensitive receptors. The State considers noise levels under 70 Ldn to be normally acceptable for playgrounds and neighborhood parks (OPR 1998).

Local

Monterey County General Plan

According to the Monterey County General Plan, construction-related noise should be managed to reduce impacts on adjacent land uses in accordance with the County's Noise Control Ordinance. For long-term land-use planning, the County considers noise levels under 65 Ldn to be normally acceptable for parks where water recreation occurs.

Monterey County Noise Control Ordinance

The Monterey County Noise Control Ordinance is a nuisance ordinance, designed to address noise levels that may be detrimental to mental or physical health. The general limitation prohibits any machine, mechanism, device, or contrivance which produces a noise level exceeding 85 dBA measured 50 feet (15.2 m) from the source (Ordinance 2450 Section 3).

4.8.3 Significance Criteria

A noise impact is considered significant if:

- Noise levels from construction, operations, or maintenance activities exceed criteria defined in OSHA regulations, in a noise ordinance or general plan of the local jurisdiction in which the activity occurs or may directly or indirectly affect sensitive receptors.

4.8.4 Impact Analysis and Mitigation

Noise from installation and decommissioning would occur at onshore staging areas and sequentially all along the cable route. Onshore activities, such as use of heavy trucks, lifts, HDD equipment, and traffic from work crews, could disrupt residents or recreational activities near the shore or along surface streets accessing the work areas. Use of marine vessels, including propulsion engines, portable power generators, or hydraulic pump engines, would also create airborne noise and underwater acoustic energy.

Impact NOI-1: Construction and Decommissioning Noise

Construction and decommissioning equipment could cause noise levels exceeding the 85 dBA limit of the Monterey County Noise Control Ordinance. (Class II)

The construction activity would occur about 600 feet (183 m) south of the Moss Landing State Beach, a sensitive receptor across the harbor channel. At the landing site, notable noise would be caused by HDD equipment, drill site preparation of the concrete pad and sump pit, drilling fluid pumping, site cleanup, and the on-road vehicles necessary traveling to the staging area. Decommissioning activities have not been identified in detail, but they would involve equipment similar to construction.

Table 4.8-2 shows the typical noise levels from construction equipment.

Table 4.8-2. Typical Noise Levels for Construction Equipment

Equipment	Noise Level (dBA)	Equipment	Noise Level (dBA)
Loaders, excavators	80-85	Pumps	76
Graders, scrapers	85-89	Generators	81
Concrete pumps, mixers	82-85	Compressors	83
		Drill rigs	70-85

Note: Typical noise levels at 50 feet (15.2 m). (Adapted from U.S. EPA 1972; U.S. DOT 1995.)

The drill rig for HDD activity would be used for about two weeks, and other loud equipment at the landing site would include excavators, pumps, generators, and trucks. Additional time would be necessary for drill site preparation and cleanup. This short-term activity would create both intermittent and continuous noises. Maximum intermittent construction noise levels would range from 70 to 89 dBA at 50 feet (15.2 m). Because equipment other than the drill rig and pumps or generators would not be continuously operated, noise levels from construction over time would be somewhat lower. At 50 feet (15.2 m), continuous noise levels would be about 85 dBA. At 100 feet (30.5 m), the noise would spread and levels would be about 79 dBA, and at 200 feet (61.0 m), about 73 dBA. Across the harbor channel at the Moss Landing State Beach, the construction noise would be roughly 60 dBA. These levels would diminish over additional distance and could be reduced further by intervening structures.

Construction would also cause noise off site, primarily from commuting workers and from trucks needed to bring materials to the landing site and to the docked vessels. Trucks and on-road vehicles would arrive at the landing site via Sandholt Road, the only

available access route. The peak noise levels associated with passing trucks and commuting worker vehicles would be approximately 70 to 75 dBA at 50 feet (15.2 m).

Short-term use of the equipment at the landing site could exceed the Monterey County Noise Control Ordinance level of 85 dBA at 50 feet (15.2 m). This would be a potentially significant impact (Class II) that could be mitigated with the following measure (**MM NOI-1a**) during construction and decommissioning activities.

Underwater noise would be caused by marine vessels, such as work boats and the cable-laying vessel, and by the main lay cable plow. These sources would be essentially continuous over the cable-laying operation. The cable-laying vessels would create underwater noise levels up to 160 dB (ref. 1 µPa) with the strongest levels being between 0.1 and 1.0 kHz. The main cable-laying ship would cause the strongest levels around 0.1 and 0.2 kHz, while smaller work boats would tend to create higher frequencies. Plowing operations would cause a higher underwater noise levels (around 185 dB) at lower frequencies (generally at or below 0.4 kHz). There are no criteria for characterizing the effects of underwater noise on humans, but because no recreational divers are expected to be close to the underwater work, this short-term impact would be less than significant (Class III). The Applicant has committed to reduce propeller noise and other noises from cable-laying activities to the extent possible by minimizing travel speeds near the shore while aiming to complete the work as quickly as possible. Potential noise impacts on marine and near-coastal biological resources are addressed in Section 4.5.

Mitigation Measures for Impact **NOI-1**: Construction and Decommissioning Noise

MM NOI-1a **Noise Control of Equipment.** Take necessary measures to muffle, shield, or enclose the HDD activity such that noise levels at 50 feet (15.2 m) from the activity do not exceed 85 dBA. Optional approaches include using low-noise mufflers on engines, surrounding the equipment with a temporary noise curtain or wall, and enclosing the equipment with an acoustic enclosure.

Rationale for Mitigation

Some equipment used during construction could approach or exceed the 85 dBA threshold. Use of proper mufflers on equipment engines and enclosing engines or mounting noise shields around noisy equipment can minimize the likelihood of exceeding the threshold. Enclosures or other barriers to noise normally provide a 5 dBA reduction by breaking the line-of-sight to the receptor. With proper shielding or enclosures, the noise levels impact would be reduced to levels that would comply with the local ordinance.

Impact NOI-2: Operation-Phase Noise

Use of vessels and scientific equipment and instrumentation during operation could create noise. (Class III)

Operation of the system would involve research activity and occasional inspection and maintenance, with the associated use of research and support boats. Boat trips traveling to the deployed instrumentation would be occasional, and the noise created by such activity would be consistent with the noise created in the existing setting by boat traffic at the Moss Landing Harbor and within the range of ordinary ambient levels. No other Project activity would be likely to cause noise on-land; power for the system would be provided by a connection to the electrical grid. Noise from infrequent marine vessel traffic over the lifetime of the MARS observatory would not be substantially different from the ship traffic noise that presently occurs near Moss Landing Harbor. As such, the noise impact would be less than significant (Class III).

Marine research sometimes involves transmission of underwater acoustic signals to gather data on water current, depth, and temperature. Transmission of acoustic signals for these purposes can result in long-distance underwater noise propagation, and long-term installations of such equipment in the MARS system could substantially change the marine noise environment. Although future plans for the MARS observatory would involve use of instruments that have not been developed yet, MBARI has indicated that at this time, all of the scientific instruments and units would be passive in nature. The need for further environmental review would be determined by MBNMS as MBARI develops new research projects. Because no new acoustic sources are anticipated at this time, no impact would occur.

Table 4.8-3. Summary of Noise Impacts and Mitigation Measures

Impact	Mitigation Measures
NOI-1: Construction and decommissioning equipment could cause noise levels exceeding the 85 dBA limit of the Monterey County Noise Control Ordinance. (Class II)	**MM NOI-1a.** Muffle, shield, or enclose the HDD activity.
NOI-2: Use of vessels and scientific equipment and instrumentation during operation could create noise. (Class III)	None required.

4.8.5 Cumulative Impacts

Construction of the proposed Project would cause short-term noise impacts. Construction impacts could overlap with noise created by other construction projects

anticipated in Moss Landing (such as utility construction and park and pier repairs). Project-related construction and other overlapping cumulative projects could temporarily contribute to incompatible noise levels for nearby receptors, when combined with the existing noise environment. The short-term noise impact of the Project (Impact **NOI-1**) would be cumulatively considerable for those locations where multiple projects briefly overlap and exacerbate noise levels. Mitigation (**MM NOI-1a**) would be necessary for reducing Project-related contributions to a less than significant level (Class II).

No notable noise sources would occur during operation of the proposed Project. As such, cumulative noise impacts during operation would be less than significant (Class III).

4.8.6 Alternative Landings

Alternative Landing Area 1: Duke Energy Pipeline to MBARI Property

This alternative would cause noise during construction of a new access hatch within the Moss Landing State Beach. The equipment used for construction within the park would be similar to that used at the HDD site, but the noise and activity within the park could occur for a shorter duration. Construction activity for the HDD would also occur about 600 feet (183 m) south of the park, similar to the proposed Project. Noise from construction equipment at the pipeline shore landing in the park and at the HDD site could exceed the Monterey County Noise Control Ordinance level of 85 dBA at 50 feet (15.2 m) for the two week on-land construction duration (Impact **NOI-1**, Class II). Implementation mitigation (**MM NOI-1a**) would be necessary to reduce the construction impact to a less than significant level.

Alternative Landing Area 2: Moss Landing Marine Laboratories (MLML) Pier

This alternative would cause noise from construction equipment at the MLML Pier adjacent to the Salinas River State Beach. The equipment noise and activity for this alternative would be essentially similar to the proposed Project, except work for the shore landing would occur over a shorter duration, and no HDD noise would occur. Construction activity on-land would occur adjacent to the Salinas River State Beach, which would cause elevated impacts on this park. Noise from construction equipment at the shore landing at the pier could exceed the Monterey County Noise Control Ordinance level of 85 dBA at 50 feet (15.2 m) for the one week on-land construction duration (Impact **NOI-1**, Class II). Implementation mitigation (**MM NOI-1a**) would be necessary to reduce the construction impact to a less than significant level.

No Project/Action Alternative

Noise from construction equipment and construction activity would not occur under this alternative. The No Project/Action Alternative would have no effect on the surrounding noise environment.